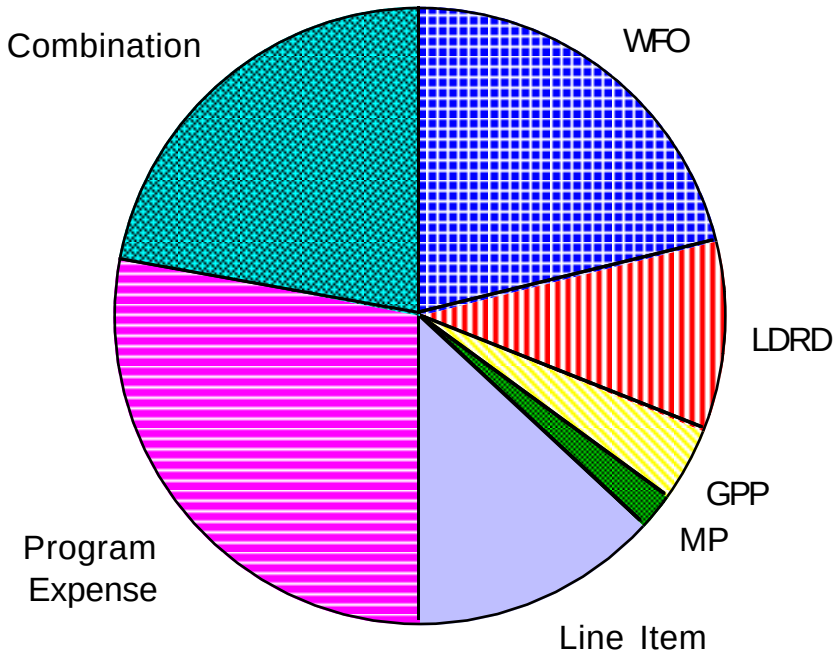
New Mexico Quality Award Application
Roadrunner Level

Facility Review Section
Los Alamos National Laboratory
October 16, 1995

LAUR-95-3640



I. Business Overview

The Facility Review Section is a non-profit information service operation. The explosion of Federal, State and Local regulatory requirements in the Environmental, Safety and Health (ES&H) arena has created a maze of inter-related and sometimes conflicting requirements that are nearly impossible for a single individual to navigate. The Facility Review Section provides services that are focused on identifying the hazards, regulatory requirements, and required actions for work performed at Los Alamos National Laboratory. The Section is a key component in the corporate processes designed to assure that work at the Laboratory is performed responsibly with respect to the safety and health of workers and the public and protection of the environment. The Section provides three services for the Laboratory:

- Facility Work Hazard Identification
    - Trained ES&H generalist technicians examine proposed facility work to identify, document and communicate the hazards and associated regulatory requirements.
- ESH ID
    - A service to identify potential physical and programmatic hazards with proposed science projects to allow for accurate costing and project design/redesign to mitigate hazards and/or costs.
- Solid Waste Management Unit (SWMU) Hazard Identification
    - A service to identify physical and environmental hazards associated with Solid Waste Management Units and any scheduling conflicts related to remediation activities.
- Excavation Review
    - A specialized service to identify physical and environmental hazards associated with excavation activities.
- Design Reviews
    - A service to identify and apply subject matter expertise required for major facility design activities and reviews of designs. The focus is to ensure regulatory compliance, accurate costing, and project design/redesign to mitigate hazards and/or costs.

Los Alamos National Laboratory is hierarchically organized into Divisions, Groups, Sections and Teams. Groups are normally the functional business units at LANL. The Facility Review Section is organizationally situated in the Environment, Safety and Health Division, and the Risk Management Group. Due to the historical fluidity in relationships between sections and groups in ESH Division, the Facility Review Section is operated as a unique business unit in virtually all ways; budget development and execution, hiring and firing, personnel development, strategic planning and process management including metrics and data analysis. Strategic planning for the Section must consider LANL and ESH Division strategies and requirements, trends in federal, state and other regulations, community and stakeholder concerns, and market and customer analysis as would any company providing the services mentioned. The Section's corporate independence is most strongly demonstrated by the fact that numerous contractors exist in groups and divisions at LANL and attempt to provide the same services as the Facility Review Section. They inevitably end up using Facility Review services to fulfill their contracts due to the quality of the services.

The Facility Review Section is organized as shown in Figure i.

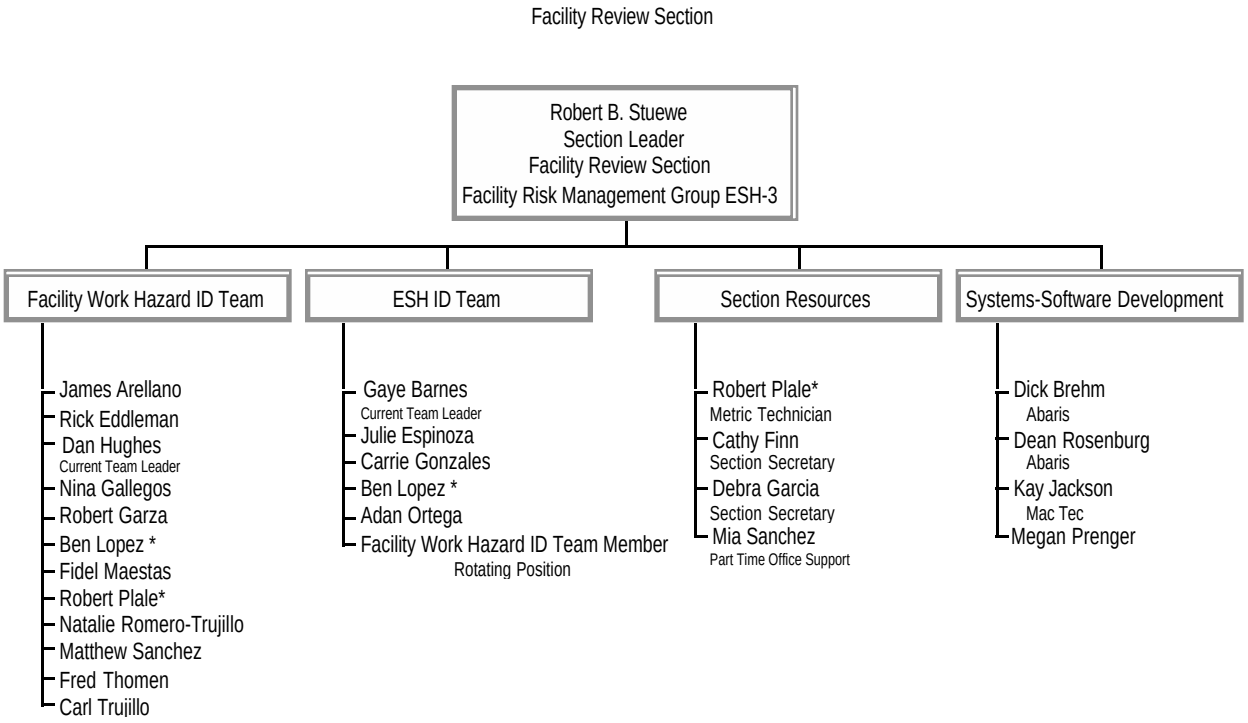


Figure i. Facility Review Section Organization. Asterisk denotes multiple assignments.

For the purposes of this application, the following terms will be used equivalently:

Company = Facility Review Section = Section
Corporation = Los Alamos National Laboratory=LANL
Senior Executive = Section Leader
Industry=Similar National Laboratories = Competitors

The principal customers of the company and their special needs and service characteristics are listed in Table i.

Table i. Facility Review customer segments and some of their distinguishing needs and service characteristics.

Customer Segments	Special Needs	Characteristics
LANL employees	Support in navigating ES&H regulatory maze	Understanding of their Needs Qualified Personnel Sense of Commitment
Facility Managers	Authorization Basis Support	Understanding of their Operation Responsiveness Timeliness Accuracy Sense of Commitment Qualified Personnel Clear Documentation Low Cost Predictability Service Delivery On-Time, On-Budget
Science Project, Proposal, and Program Developers	Accurate identification of hazards and regulatory requirements	Responsiveness Timeliness Accuracy Flexibility Ability to work with conceptual detail Sense of Commitment Understanding of their Project Understanding of their Funding Issues Clear Documentation
LANL Line Managers	Employee Safety	Reliability Cost Consciousness
LANL Corporation	Documented Hazard Identification and Disclosure	Accuracy Qualified Personnel Clear Documentation Traceable Methodologies

The company has identified three key business drivers at this point in time.

- The first is a pressing need to reduce operating costs and has its roots in the national economy and the international business trend of continuously increasing productivity.
- The second driver is a need to align company processes with LANL facility management and science development. These are the most complex customer segments and play pivotal roles in the future of Los Alamos National Laboratory. Science development is at the core of all major funding at LANL. Facility management organizations provide key service points for maintaining the safety of LANL operations and staff. The two segments do not overlap significantly, providing for natural process development without the types of internal redundancies often found in corporate support processes.
- The third driver is the need to excel at operating during periods of rapid change. The end of the cold war, the national and congressional fiscal and political concerns, and the business revolution is affecting the Corporate environment in a time-synchronized manner. This has created a business environment showing exponential rates of change.

The combination of fast-paced, one-of-a-kind, multi-disciplinary, research and development involving hazardous operations in a complex regulatory environment limit the number of equivalent business operations. The company views ES&H operations at Lawrence Livermore National Laboratory, Sandia National Laboratory and Lawrence Berkley National Laboratory as the three most similar environments, although none of the three has the exact match of characteristics previously described. These laboratories are referred to as "sister" laboratories and used in a comparative sense as "competitors" would be in private industry. Examining this "industry," the company has found similar processes in some cases, but no comparative processes to the company's most modern service, the ESH ID. Additionally, management-by-fact and customer focus are not yet incorporated into their processes. Combining this with knowledge of efforts underway at all three sister laboratories to implement processes emulating the ESH ID, leads the Facility Review Section to believe that it is clearly leading its industry in process design and management.

The Facility Review Section employs 23 personnel, with a mix of full-time, part-time and seasonal employment. The combination of contract and permanent staff breaks down as follows: 13 technicians, 3 staff, 3 programmer/analysts, 2 secretaries and 2 students. The educational breakdown is 17% advanced college degrees, 30% 4-year degrees, 30% 1-3 years of college education, and 22 % with combinations of high school and technical degrees. The company's diversity profile is 39% White, 57% Hispanic, 4% Native American, and 43% Female.

The services provided by the company are information intensive and use information systems incorporating laptop and desktop computers, computer networks, relational databases, word processing, and graphical user interface technology. To provide instant communication between employees, the company uses combinations of cellular phones, pagers and fax machines. A small fleet of vehicles is used to service the 43 square miles of customer space.

The company relies on two main supplier groups: ES&H Subject Matter Experts (SMEs) and Information System and Software Developers. SME services are provided by approximately 50 individuals from what can be viewed as 16 separate companies. Information system and software services are currently provided by two companies. Some support services contracts are in place for information systems maintenance and administrative services, but these individuals are managed more as company employees would be.

The company operates in a complex regulatory environment. Regulating agencies include the Federal Government, the State of New Mexico, the Department of Energy (DOE), the University of California (UC) and the State of California. In many cases, the actual applicable regulations are a mixture of laws and guidelines from all three, sometimes conflicting in basic ways. Regulations are expressed through Federal Law (CFR), State Law, and DOE Orders, Standards and Guidelines. With the complex regulatory environment come rigid process controls for procurement, employee reward, hiring and firing, that the company must adhere to. The company's annual funding cycle is dominated by Congressional and Administrative actions on the Energy Appropriations and Defense Appropriations Bills each national budget cycle. Annual budgets do not stabilize until at least the second quarter of each fiscal year. Fiscal years run October 1 - September 30, inclusive.

1.0 Leadership

1.1 Senior Executive Leadership

The Facility Review Section uses three systems to provide effective leadership and direction by the Senior Executive, the Section Leader. These systems each apply to all company employees.

The first system is the weekly company meeting led by the Section Leader. The meeting follows a formal agenda consisting of near-term work items submitted by employees prior to the weekly agenda creation and long-term strategic activities undertaken as part of the strategic plan.

The second system, detailed in Section 3, is the company strategic planning process. Scheduled at approximately nine month intervals, planning sessions track and modify company strategy and tactics. All company employees participate in these sessions with the Senior Executive. Employees facilitate portions of the discussions to allow the Senior Executive to be a participant and to encourage freer discussion.

The third system is the Corporate Performance Appraisal process as implemented by the Senior Executive. This is a formal tool for communication and negotiation between the Senior Executive and the company's employees. The process entails evaluating the employees' performance for the previous period, negotiating future job assignments, setting goals for individual performance, and relating them to the company's mission. The process involves an open feedback session for any topics of concern between the employee and the Senior Executive. The Senior Executive averages sixteen hours per employee, per year, to execute this process. Employees spend 1-2 hours in one-on-one discussions and negotiations with the Senior Executive.

Key elements of the company's organizational structure are uniform Job Factors and Standards for all employees. These are an expression of values the company espouses in a quantifiable manner. A significant amount of the SE-employee performance appraisal one-on-one time is spent discussing the factors and standards to ensure common understanding of the values and expectations. Table I lists these factors and standards.

The Senior Executive is directly involved in reviewing company performance in a number of ways. Review of quarterly metrics and preparation of the Division Quarterly Progress Reports, as well as the review of annual metrics, evaluation of the company's strategic planning sessions, and preparation of the New Mexico Quality Award Application are integral parts of the SE's job. The SE routinely meets throughout the business year with customers, stakeholders, and competitors to gain an external perspective of company performance.

There are a number of systems in place for evaluating and improving leadership in the company. The Senior Executive is appraised by his manager and by the company's employees in an Upward Appraisal Process. The leadership of employees is evaluated as described by Table I. Employee leadership is developed via two systems. The first is a formal Acting Senior Executive Program that includes authoritative decision making responsibilities during the SE's absence. The second involves project assignments designed to challenge the employees leadership skills and establish a mentor relationship with the SE. It is important to note the company clearly indicates its belief that all employees have leadership capabilities and that, in order to build the strongest organization possible, those capabilities be developed to the greatest potential.

Table I. Facility Review values expressed by Job Factors, Standards and Expectations.

Job Factor	Standards and Expectations
Technical Competence- to understand ES&H requirements and processes, guide others, solve problems	To meet this requirement the employee should have detailed knowledge and experience with a broad range of ES&H regulations, rules and implementing DOE Orders. The employee should be viewed as an expert on the processes for which they are responsible while being able to provide support and problem solve in other areas of team responsibility. Performance in this area will also be demonstrated by the quantity and quality of work which is provided during the review period.
Teaming - working with others to maximize the quality of the team product.	To meet this requirement an employee will implicitly cooperate with other team members. They will recognize other team members for their roles ideas and contributions. They will accept direction and tasks as part of their team role and demonstrate an attitude that is positive, supportive and constructive. They will demonstrate good listening skills and sensitivity for the feelings of others. They will demonstrate integrity as evidenced by the trust of fellow team members. When required, employees will lead team efforts in a manner that leads to consensus and stresses the achievement of team objectives. As a member of a Self-Directed Work Team employees will have the roles of: Skilled Reviewer, Trainer, Technical Resource, Problem Solver, Decision Maker and Customer Advocate. Exceptional performance in this factor would be demonstrated by effort above that of team participation, that significantly improves the results of the team, and that shows a strong awareness and commitment to team building.
Leadership - defining vision and then influencing others as needed to meet team goals and implement the vision	To meet this requirement an employee will gain the cooperation and commitment of others as necessary to achieve assigned tasks, to support team objectives and to achieve the vision. They will recognize and apply appropriate leadership styles as required in interactions with others. They will use other employees strengths to accomplish required tasks and recognize and develop the potential in all colleagues. Employees should adopt and exhibit an attitude of continuous improvement in all aspects of their work and motivate others to follow suit. They will demonstrate effective coaching and conflict resolution skills. Exceptional performance as a leader is demonstrated by team success in achieving challenging objectives, by success in teaming across organizational and functional boundaries, and by increasing demonstrations of leadership skills in those whom an employee is leading.
Customer Interaction - the ability to identify customers and their expectations and then provide services to exceed those expectations.	To meet this requirement Facility Review employees should have identified customers for each of their services/processes. For each customer, they should have an understanding of their needs and expectations. Employees should be facile in interfacing with all types of customers: comfortable, indecisive, irate and insistent. Exceptional performance would be demonstrated by repeated and consistent expressions of customer satisfaction and/or by positive trends of data metrics linked to customer satisfaction.
Company Citizenship ES&H Property Policy, Procedures Participation	To meet this requirement Facility Review employees should understand and comply with and support the company's policies and procedures, DOE, State and Federal Regulations applicable to their roles and responsibilities specifically including the areas of ES&H, property and security. As requested, employees should attend organizational meetings working on these procedural issues or disseminating information concerning their responsibilities. Exceptional performance would be demonstrated by active and successful participation on cross-functional or cross-organizational teams that are solving complex problems.

The leadership abilities of the Facility Review Section are not limited to the section itself. At the next level of corporate management, the management team upon which the Facility Review SE sits as a member has shifted its approach to a strategic, consensus-based teaming methodology. Facility Review employees are requested to serve as leaders and participants on Division and Corporate Continuous Quality Improvement Teams. The SE has served as a Division Level Reengineering Process Owner and sits on two Corporate program steering groups. Other section employees have served on six teams tasked with developing strategies aimed at improving processes at the Corporate level.

1.2 Leadership System and Organization

To implement the vision and gain the cooperation and commitment from employees, the Facility Review Section organized two process-focused Self-Directed Work Teams. The teams, created subsequent to a strategic planning session, are supported by company administrative and technical resources and focus on customers identified as "strategic" from the session and company plan. Extensive training over the previous year facilitated the transition to this modern work approach.

To sustain focus on performance, metrics are accumulated as a section process. Metrics are arrayed on public display in a location frequented by company personnel, Division level managers, and many Corporate heads and stakeholders. The display provides Facility Review Section performance metrics with a degree of visibility uncommon elsewhere in the Corporation. It is maintained by a sub-team comprised of members of the SDWTs and section administrative resources.

Communication and reinforcement of values throughout the company is constant as described in Section 1.2. Overall company performance reviews occur quarterly at the Section Level, the Group Level, and the Division Level. The senior executive for each management level is present at the progress reviews. It is important to note that the goals against which company progress is measured are set by the Section employees and the Senior Executive. The Section Level reviews are usually incorporated into the pattern of normal company weekly meetings.

1.3 Public Responsibility and Corporate Citizenship

Services of the Facility Review Section are a key element in corporate processes and demonstrate corporate responsibility toward worker safety and health, as well as public and environmental protection. In fulfilling these responsibilities, the Facility Review Section is responsible for initiating analysis by public involvement and review committees for Animal Studies Research, Human Studies Research and National Environmental Policy Act processes. Services provided by the company are utilized by corporate stakeholder and in community involvement processes.

The employees of the company are active in the cultural and social fabric of their communities through participation in volunteer, religious, and athletic organizations. Professionally, membership and participation in organization such as the ASQC is

encouraged and supported. The company has supported Quality New Mexico with the Senior Executive serving as a Lead Examiner for NMQA. Employees publish their work and participate in national organizations such as the Energy Facilities Contractor Organization Group (EFCOG)- Safety Analysis Working Group. Company employees are frequently requested for corporate quality improvement activities.

2.0 Information and Analysis

2.1 Management of Information and Data

The company's data selection and evaluation process has been quite simple to this point. Based upon customer requirements, strategic decisions and experience in Total Quality Management, the senior executive selects data to be accumulated and directly tasks the metric technician. Feedback, from the technician, as to cost of collection and analysis to the SE is factored into the decision. Passing these hurdles, the data is collected for the fiscal year, most on a quarterly basis. At the end of the fiscal year data is evaluated for required changes for the upcoming year. The company budgets for data collection and analysis. This allows for prioritization and optimization and is used in the process to monitor and maximize return while ensuring deployment across all services.

With the creation of the Self-Directed Work Teams, responsibility for the team specific portions of data selection and evaluation is being turned over to the teams and team leaders. Fiscal Year 1996, starting October 1, 1995, will see the initiation of intense employee involvement in data selection and the evaluation process.

Notable improvements have occurred in data collection to date as a result of the current processes. The SDWT Leaders initiated a baseline team performance survey instrument as part of team creation. Customer feedback is being translated into collection of additional data to support customer decision making. Sufficient company data has been collected at this point to begin analysis of second order information such as derivatives, combinatorial functions, and long term trends.

2.2 Competitive Comparison and Benchmarking

Two systems are in place for benchmarking Facility Review services and processes. The first consists of annual meetings, communications and publications reviews designed to monitor the developments of competitive processes and services at sister laboratories. The combination of hazardous operations and the unique regulatory environment make comparisons with traditional industry of very limited value, but clearly identify the three laboratories with comparable requirements. Process benchmarks indicate competing process and service within the sister laboratories are not yet developed to a degree that quantifiable results are available. After communicating with the Facility Review Staff, all are currently implementing processes similar to those mentioned here. Their efforts at emulation clearly verify the position of the section as a leader within the national laboratory complex where comparative operations and regulations exist.

The second benchmarking system uses data from other corporate service operations within the LANL environment; however, little data is available through this avenue that is applicable. Two exceptions include Facility Delivery Services and selected Environment, Safety and Health processes. These data are evaluated for usefulness and used in analysis of Facility Review data where found appropriate. Fiscal year 1995 is the first year comparison data has been available, so the benchmarking process is still under development.

2.3 Analysis and Use of Company-Level Data

The process for data analysis and use has four steps; (1) Review by the Senior Executive to gain a sense of overall company performance, (2) SE presentation to the entire company for discussion and analysis, (3) Incorporation into the next scheduled strategic planning session, and (4) Dissemination of quarterly progress reports. Some specific analysis and uses are illustrated in Table II.

Table II. Facility Review Section data and analysis descriptions.

Data	Type	Analysis	Use
Demands for Service	Counts	Comparison with previous fiscal years for trending	Staffing, Resource Allocation, Customer Satisfaction
Unit Cost for Service	Quarterly Calculation	Minimal Cost	Measure minimal cost of service in a fixed operational cost environment, measure peak performance
Education, Training, Experience	Cumulatives and annuals for company	Combinatorial function to measure employability of workers	Employee well-being, social contract when employment cannot be guaranteed
Unit Cost for Service	Annual Average	Comparison with previous fiscal years for trending	Staffing, Resource Allocation, Customer Satisfaction
Customer Satisfaction	Survey, Comments	Process Flaws, Relationship analysis	Design and Test Process Improvements
Service Use by Customer Segment	Counts	Comparison with strategic customer list	Effectiveness in executing strategic plan

3.0 Strategic Planning

3.1 Strategy Development

The company executes a strategic planning process every 9-12 months. Two sessions, in September 1994 and June 1995, have been held to date. The next is scheduled for December 1995. The strategy focus leads to decisions regarding company capabilities and customer segments as determined by informational analysis. All company employees, processes and services are included. A conscious decision to be near-term focused, using 18-24 month time frames, has been made by the SE and employees in order to deal with the extremely fast rate of regulatory and corporate change. The company strategic planning process is outlined in Table III.

Table III. Facility Review Section Strategic Planning Process.

Step/Action	Responsible	Result
Analysis of Corporate Strategies and Goals	Senior Executive	Long Term Focus
Analysis of Regulatory Changes	Senior Executive and Peers	Short and Long Term Focus
Analysis of Funding Changes	Senior Executive and Peers	Short Term Focus
Presentation of Analysis at Strategic Planning Session	Senior Executive and company employees	Initiation of strategies review
Validation/Modification of Mission/Vision/Goals	Senior Executive and company employees	Strategies Review
Validation/Modification of Strategic Customer Focus	Senior Executive and company employees	Short Term Focus
Review of Unique Capabilities	Senior Executive and company employees	Short Term Focus, Development Plans
Discussion of organizational or process changes as a result of strategy modifications	Senior Executive and company employees	Action assignments if any
Discussion of process for planning and possible improvements	Senior Executive and company employees	Modifications to next strategic planning session
Modification of individual goals and objectives to include strategy modifications	Senior Executive and individual employees	Transition to strategy implementation
Modification Quarterly Progress Report Objectives to include strategy modifications	Senior Executive	Transition to strategy implementation
Modification of weekly meeting agenda to include strategy modifications	Senior Executive and staff	Transition to strategy implementation

Changes occurring during time periods between planning sessions are accommodated at the weekly company meetings.

3.2 Strategy Deployment

Three key business drivers have been developed through the strategic planning process:

- A need to continually reduce operating costs to improve customer satisfaction and prepare for the shrinking corporate and national budgets.
- A need to realign company processes with the developing corporate facility management system and scientific program development.
- A need to modify company processes such that high quality operations are sustainable in periods of extremely rapid change.

Two unique capabilities of the company have been identified and targeted for strategic use:

- The ability to build and maintain long-term relationships.
- A technical perspective of ES&H issues that is broad rather than deep.

When integrated with the data selection process of Section 2, and the analysis of the Results in Section 6 and 7, these business drivers have translated directly into business decisions that include operations/development budget ratios, organizational decisions (SDWTs), and a focus on employability as part of Human Resource Planning. The last several elements of Table III outline deployment processes for strategic planning activities. Specific process based targets and requirements are outlined in Section 5.2. Projections for key service demands and requirements that have resulted from the strategic planning sessions are shown in Table IV.

Table IV. Near- and Long-Term service demands and requirements resulting from strategic planning activities.

Service	Near-Term Demand/Requirement	Long-Term Demand/Requirement
ESH ID	Network capability More Resources to sustain operation	1200/yr. at <$500 unit cost Cycle time to 2 days
SWMU Review	More trained resources Greater cross-training of personnel	Decreased demand Few-100/yr
Work Review	Increased Facility Manager Satisfaction	Deployment as Facilities Staff Computerized to decrease cycle time
Design Review	Eliminate	None for Facility Review
Excavation Review	More closely tied w/SWMU Reduced supplier availability Increased Facility Manager satisfaction	1 day cycle time

4.0 Human Resource Development and Management

4.1 Human Resource Planning and Evaluation

The Facility Review strategic planning activities have been translated into two human resource strategies:

- Within the context of the SDWTs, develop personnel through high levels of cross-training to maximize resource use, minimize customer waiting time, increase overall process knowledge, reduce operating costs, and increase employee satisfaction.

- As a company, develop a program to increase employability of personnel, shifting the company/employee social contract from one of permanent employment to one of employability maintenance.

Actions take as a result of these strategies include:

- Team developed qualification cards to identify training requirements and ensure cross-training.
- Specific near and long term employee development plans refined on an individual basis.
- College education opportunities available for employees performing at a Fully Satisfactory or greater level.
- Ratings for team performance as part of individual performance appraisal.
- Awards to recognize both individual and team support actions.
- Development of an "employability" metric to measure and evaluate progress across the work force.
- Measurement and analysis of training and education to track progress on qualification cards.

It is important to note the company is highly regulated in the forms of rewards and recognition it can provide for its employees.

4.2 High Performance Work Systems

High performance work is encouraged through both organizational and recognition systems.

Organizationally, process work is performed by two Self-Directed Work Teams. The teams provide for a narrower process and customer focus, increased individual freedom and responsibility, and greater cross-training opportunities. Traditional supervision is not used in this approach. To maintain process understanding across SDWT boundaries, team members from the Facility Work Hazard Identification Team rotate in filling a position on the ESH ID Team. This facilitates rapid communication and understanding concerning the impacts of process changes and the resources available on the two teams.

As described in Section 1.1., in terms of recognition, employee evolution is highly value-based. Individuals are recognized both for their personal contributions and for their team's contributions. Two company awards were given for individual performance during 1995. Peer award systems are available to the teams to use as they

feel appropriate during Fiscal Year 1995. High performance work by the company has been recognized through a corporate Distinguished Performance Award Nomination

Two additional systems are also used. First, the company metric display described in Section 1.2 uses a SDWT that crosses normal team boundaries to create and maintain this public display, making it employee-owned rather than management-owned. Second, employees are empowered through technology, such as laptop computers for field work, desktop computers, cellular phones and pagers to facilitate communications.

4.3 Employees Education, Training and Development

Three systems are in place to support employee education, training, and development:

- An employee-controlled and directed qualification card process is a tool used to define the training required to support the processes operated by the SDWTs. Technical, organizational, and personal development training are included.
- Individual training and education as part of an employees development plan negotiated with the Senior Executive.
- Project assignments designed to provide "stretch" goals for employees, and establish a mentor relationship with the SE.

Training usually refers to classroom instruction from a trained and qualified instructor. Cross-training is normally delivered by a peer competent in the arena. Seminars refer to the use of presentations by corporate or national subject matter experts. Education refers to instruction from accredited college-level institutions.

Reinforcement is accomplished by alteration or addition to job assignments. If one or a few individuals are the only employees trained through a course, it is the company requirement that they then present the material formally at the weekly meeting to both transfer and solidify knowledge acquisition. This serves as an evaluation of the training and builds employee presentation skills.

Education and training are tracked as part of the company metrics.

4.4 Employee Well Being and Satisfaction

It is important to note that the Facility Review Section is composed of safety and health technicians and staff. Additionally, to monitor the quality of the work environment, a safety committee and safety representative are used, both for inspection and for training and communication. Within the company directly, time is available for physical health maintenance. Corporate systems are also used such as a Health and Fitness Center and the corporate Facility Management system for safety envelope maintenance.

Three instruments are available to measure and communicate employee well-being and satisfaction:

- Upward Appraisal of the Senior Executive.
- The Worksheet meeting portion of the Performance Appraisal Process.
- A Survey instrument used by the SDWTs on Managing Change and Conflict. Baseline data has been accumulated.

5.0 Process Management

5.1 Design and Introduction of Products and Services

Three systems are in place for the design and introduction of products and services:

- Minor process changes are handled at the Self-Directed Work Team level using a Plan-Do-Check-Act approach. Changes and reviews are conducted by the SDWT.
- Process changes with regulatory implications are conducted using a Memorandum of Understanding approach to document formalism.
- Major process and technology development is handled with more formal processes. Formal Continuous Quality Improvement Team methodologies are used. Software development uses traditional software quality assurance methodologies with increased emphasis on a phased approach heavily reliant on iterative-prototyping. To date, the Computer Assisted Review System Project (CARS) is the only major technology development. The following table describes the project and milestone approach used to develop CARS.

Table V. Computer Assisted Review System Project Schedule

Date	Milestone	Comments
6/93	Project Start	
7/93	Project Scope Definition	Chose Modular Approach with Rapid Prototyping
7/93	Brief CQI Team	Input Corporate Wide
8/93	Requirements Document	Reviewed by Facility Review
8/93	Identification of related work at other DOE sites	No Comparable processes
8/93	Document potential compliance requirements databases	
9/93	Identify Schedule, Resources, Milestones	
10/93	Field test first module - Project Profiler V 0	Automation for data capture purposes
1/94	Initiate RAM Design	
4/94	Interview Suppliers	Mostly Subject Matter Experts
4/94	Second Module in Field-Project Summary V1.0	Next Iterative Step - Focus still on Data Capture
4/94	Review of Corporate Requirements for RAM	
7/94	Project Summary updated to V 1.1	Based on feedback from field use
8/94	Competitor Visits	Benchmarking our process/new product
9/94	Third Module in Beta - Project Profiler V 1.0	
9/94	Work For Others Form Incorporated	First major customer requested change
5/95	Project Summary Profiler Revisions	
5/95	Project Profiler in Field Use	Production
6/95	Project Profiler V 2.0	Based on Field Use
10/95	Full CARS in Field Use	V 1.0 of full modular system

Launch difficulties are minimized by the iterative-prototyping design approach, by involving customers in product/service evaluation in a consensual way, and by ensuring that backup systems remain in place until products/service are fully tested in field conditions.

The Facility Review processes place a new product into continuous quality improvement mode instantly upon launch. Defects indicated by SME Quality Assurance Review of ESH ID documentation are tracked to measure improving quality of the product/service. Customer surveys, cost metrics, and team evaluations are similarly used.

5.2 Process Management: Product and Service Production and Delivery

Processes in the Facility Review Section are managed by cost, target values, identified measurements, and responsibility assignments. Process management can further be describe at the company level, the SDWT level, or the customer level. The following table provides details on a process basis.

Table VI. Facility Review process characteristics and responsibilities.

Process	Requirement	Target	Measurement	Responsible
ESH ID	Cost (including supplier costs)	$500	Operations and Supplier Costs	Section Leader Metrics Technician
	Effectiveness	Customer Satisfied	Repeat Customers # Presentations Demand # Occurrences	Section Leader Metrics Technician ESH ID Team
	Response	Next Day	Date Meet with Customer	ESH ID Team
	Response	2 week supplier delivery	Date Supplier Provides Information	ESH ID Team
	Accuracy	No Significant Information Omissions	Percent SME QA Check	ESH ID Team
Design Review	Cost	None	Operations and Supplier Costs	Section Leader Metrics Technician
	Effectiveness	Quality of Information	Customer Analysis	FSS-6
SWMU Review	Cost	$200	Operations and Supplier Costs	Section Leader Metrics Technician
	Accuracy	No Significant Information Omissions	Occurrences	FWH ID Team
Work Ticket Review	Cost	$20 Average	Operations and Supplier Costs	Section Leader Metrics Technician
	Accuracy	No Significant Information Omissions	Occurrences	FWH ID Team

Table VI (Continued). Facility Review process characteristics and responsibilities.

Excavation Permit	Cost	$50 Average	Operations and Supplier Costs	Section Leader Metrics Technician
	Accuracy	No Significant Information Omissions	Occurrences	FWH ID Team
	Response	24 hr, 2-14 day based on priority	Date review to customer	ESH ID Team FWH ID Team
	Response	2-14 day supplier delivery based on priority	Date Supplier Provides Information	ESH ID Team FWH ID Team

The responsible party is tasked with evaluating and improving performance in the specific requirement area. Some systems used are: process mapping at the SDWT level, project improvement budgets for technology evaluation and application, alternative technologies (laptops, desktops, Graphical Information Systems, cellular phones, pagers, relational databases), and continued focus on communication effectiveness (training, colored transmittals, presentations). Continuous Quality Improvement methodologies and Reengineering methodologies are used when appropriate.

Customer input and feedback is regularly evaluated and incorporated. The most dramatic example to date is strong customer dissatisfaction leading to creation of a CQI Team involving customers, which eventually led to reegineering an old process, known as the ESH Questionnaire, into the new ESH ID process and dramatically improving customer satisfaction and reducing costs.

5.3 Process Management: Support Services

Two support services are managed by the company: administrative and information systems support. Administrative support is managed through the use of the Performance Appraisal Process, and corporate-wide teaming with other administrative specialists. In beta version are processes for:

- Commitment and Task Tracking.
- A formal procedures manual.
- Measuring telephone communication response and effectiveness.

Information Systems Support is managed through a contract between the company and the supplier. Direct customer satisfaction feedback is the primary control mechanism.

5.4 Management of Supplier Performance

The Facility Review Section is dependent upon two supplied services: Subject Matter Expertise from ES&H Subject Matter Experts (SMEs), and Information System Software Development. Both are managed with a partnership approach.

Requirements are communicated to SMEs using two processes. The first is individual meetings to work out details of the interface between the Facility Review Section and the supplier SME. Presentations are also made to blocks of SME suppliers. A "joint destiny" partnership approach is used. This is demonstrated by modifications of company processes to allow SME suppliers to dramatically improve the quality of their products and services, and by joint meetings between Facility Review staff, customers and SME suppliers to address specific customer needs.

Information System Software Development is managed by a more formal process using contracts with specified deliverables and milestones. A "joint destiny" partnership approach is also used in this relationship as evidenced by joint Facility Review personnel, Facility Review customer, and Information System Software supplier meetings. The approach is further evidenced by company promotion of the partnership's success in support of supplier marketing.

SME supplier services are monitored and evaluated by Facility Review staff. The SDWTs are responsible for monitoring, evaluating and improving performance of suppliers and the company-supplier interface. All information provided is reviewed before incorporation into the products delivered to the customers. Measurements that are tracked and trended include supplier service cost, effectiveness of the company-supplier interface, and customer satisfaction with the company's SME suppliers. Information System Software Development is evaluated based upon progress against the project plan, and the impact of development upon overall company performance.

6.0 Business Results

6.1 Product and Service Quality results

Quantifiable service quality data have been measured for most Facility Review services. Overall company quality is also monitored through corporate and contractor ES&H incident reports. Multiple company members, including the SE, monitor the weekly reports. Where the Facility Review Section is cited as playing a role in a direct or indirect causal manner, corrective action plans are created and executed. This mechanism has been invoked once for SWMU Reviews and once for Facility Work Reviews over the last three years. Thus, the data density does not require sophisticated tracking, trending, or display. Incidents not causally connected with the company, but in which a company employee believes there are lessons to be learned, are discussed at the weekly meetings.

The Facility Review Design Review Service was measured to be the most cost-effective and accurate design review service in the corporation by another corporate division. The service was also measured to be significantly lacking in timeliness of service.

Figure 6.1.1 demonstrates the defect reduction rate in the ESH ID service processes. Improved supplier relationships, also in the same figure, have been analyzed and are the primary causal factor in defect reduction.

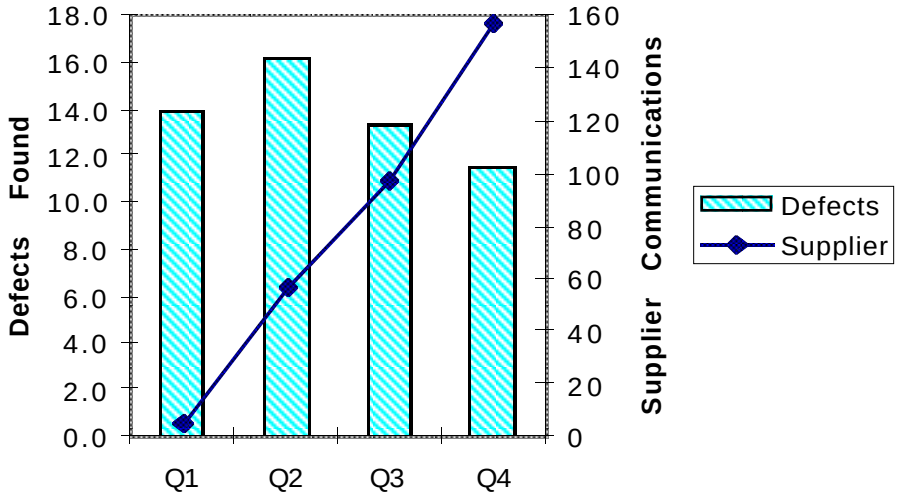


Figure 6.1.1 Reduction in ESH ID defects attributed to increasing communications with suppliers. Communications focused on requirements and process specifics. Subsequent process modifications also affected the defect rate.

Figure 6.1.2 demonstrates service unit cost trends for Facility Review services as trended across Fiscal Year 1995. Work Review costs have not been completely analyzed at the time of this application due to their number (>12,000). Fiscal Year 1994 review service costs averaged $32/review, however, resource shifts and process changes require a more detailed analysis for Fiscal Year 1995.

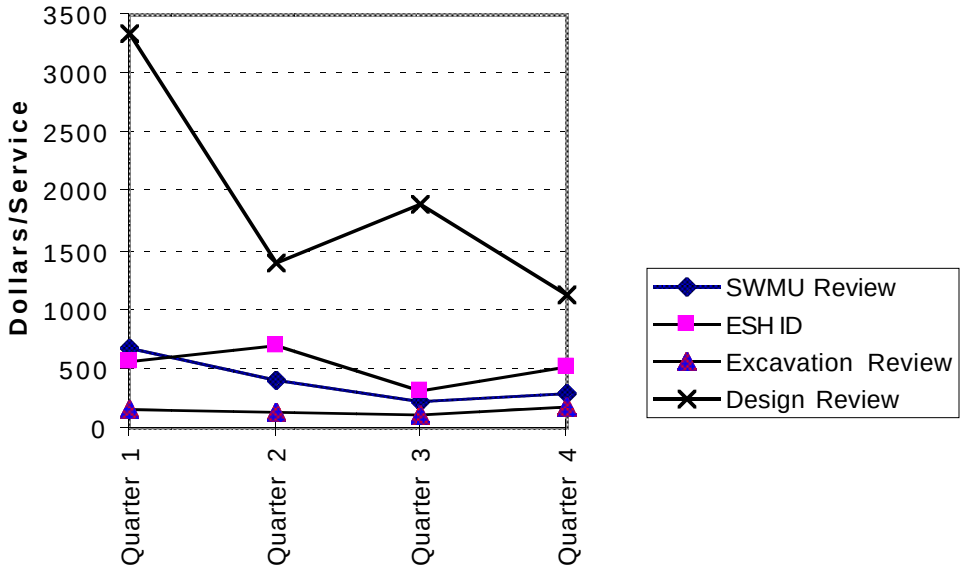


Figure 6.1.2 Service unit costs trends for Fiscal Year 1995

6.2 Company Operational and Financial results

A major business driver for Fiscal Year 1995 was to reduce operating costs. The two approaches used were technology development and the application of modern team approaches. Figure 6.2.1 quantifies the successful application of the technology development budget. Figure 6.2.2 provides a breakdown of those costs by service.

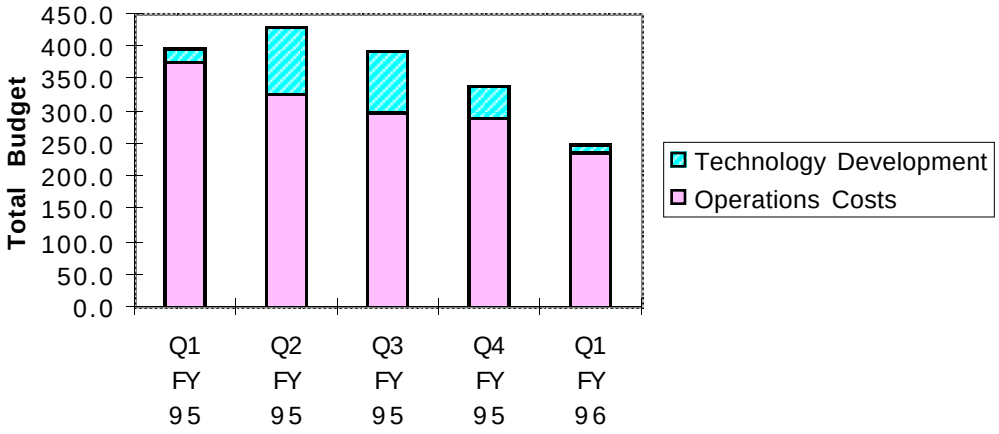


Figure 6.2.1 The relationship between company operating costs and quarterly spending for technology development and implementation.

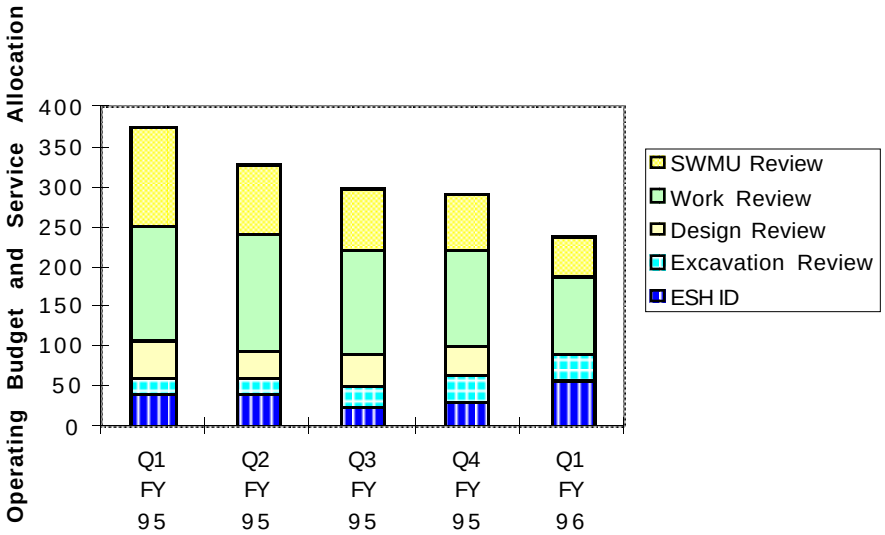


Figure 6.2.2 Company operating cost as a function of service,trended by quarter.

Increasing ESH ID operations costs in the first quarter of Fiscal Year 1996 are a result of the company staffing to pursue increased market share with an aggressive marketing campaign. This demonstrates the use of company resources in a strategic manner.

Unit costs are tracked both quarterly and annually. Annual averages provide trending for overall company performance. Quarterly costs, however, are excessively sensitive to the level of demand and cannot be usefully trended. Minimum quarterly unit costs can be tracked and are a good indicator of peak company performance capability by service. Annual average unit costs have been reduced for the most expensive of the Facility Review services as shown by Figures 6.2.3-6.2.6. Figure 6.2.7-6.2.9 demonstrate service demand profiles and.

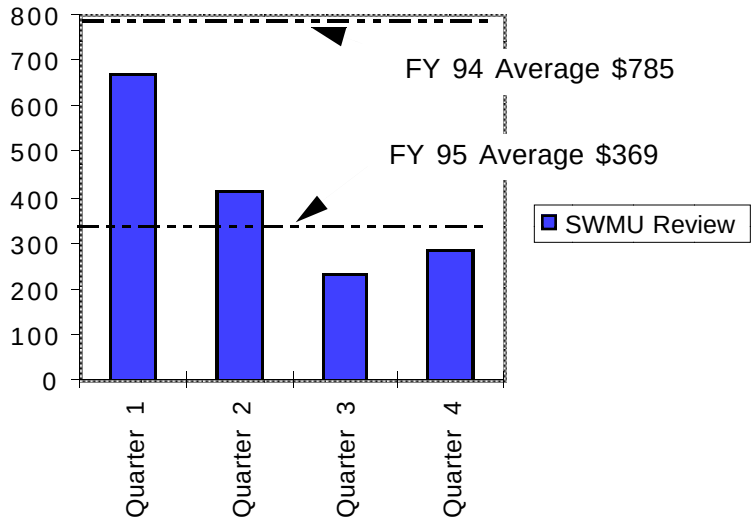


Figure 6.2.3 SWMU Review unit costs by quarter. Average cost comparison with Fiscal Year 1994. Note minimum unit cost in third quarter.

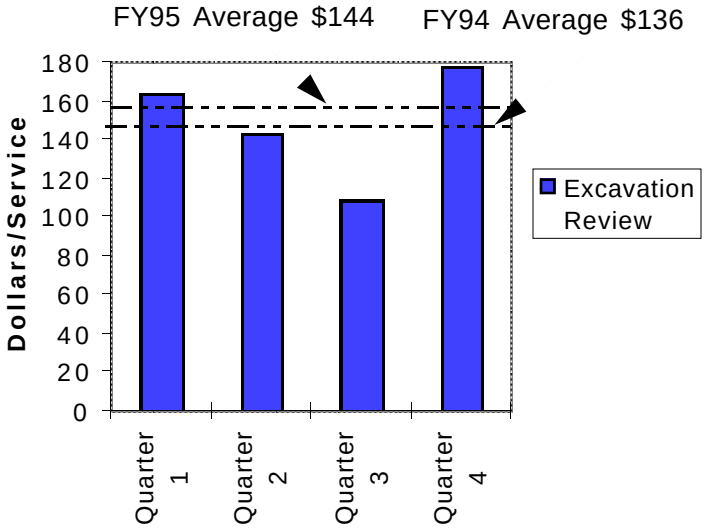


Figure 6.2.4 Excavation Review unit costs by quarter. Average cost comparison with Fiscal year 1994. Note minimum unit cost in third quarter.

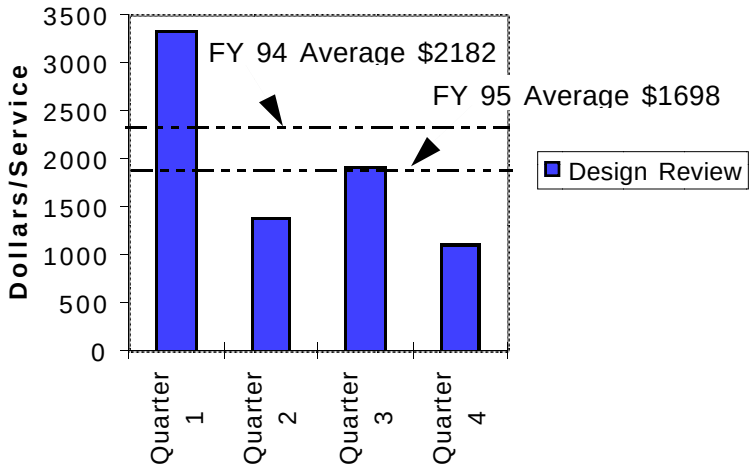


Figure 6.2.5 Design Review unit costs by quarter. Average cost comparison with Fiscal year 1994. Note minimum unit cost in fourth quarter.

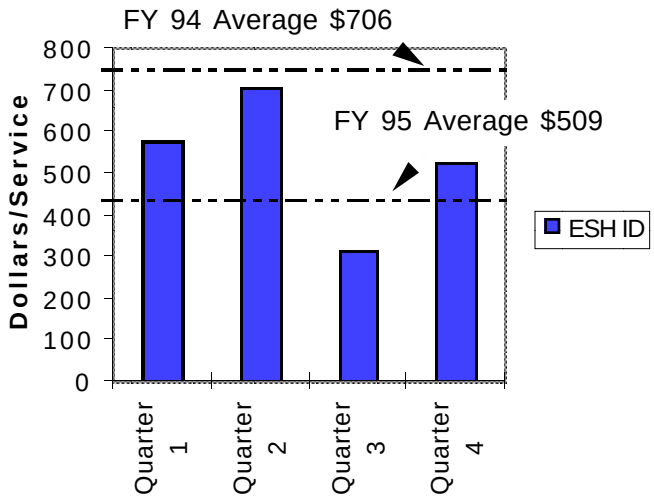


Figure 6.2.6 ESH ID unit costs by quarter. Average cost comparison with Fiscal year 1994. Note minimum unit cost in third quarter.

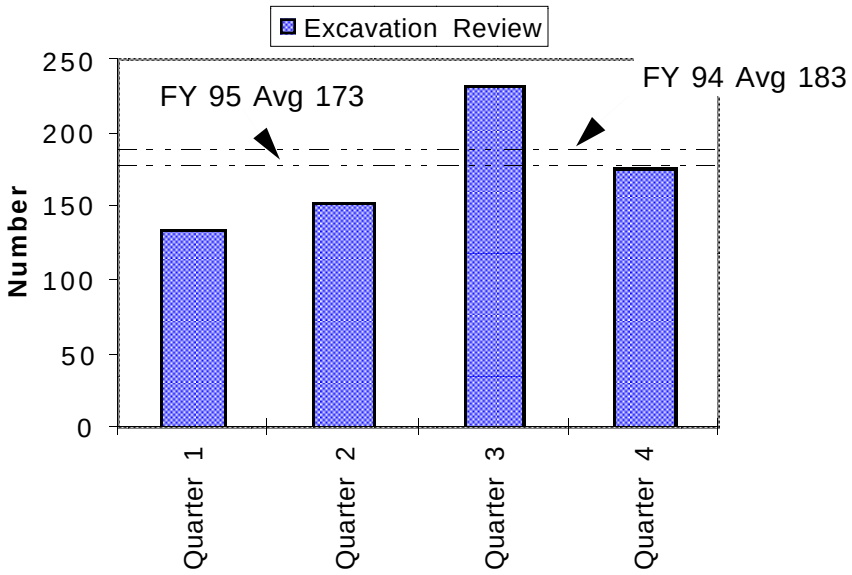


Figure 6.2.7 Traditional company service demand profile as demonstrated by excavation review profile.

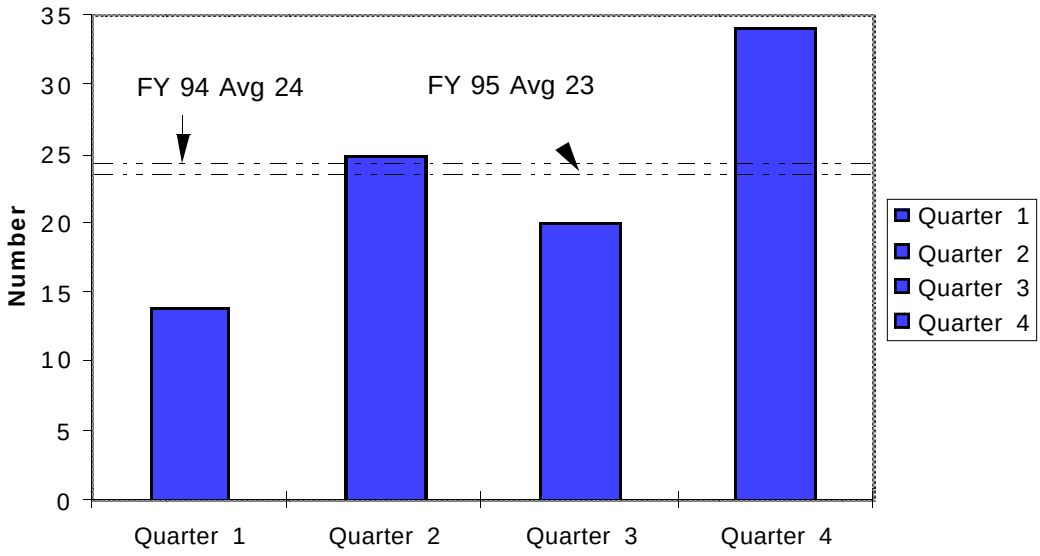


Figure 6.2.8 Design Review service demand profile for Fiscal Year 1995.

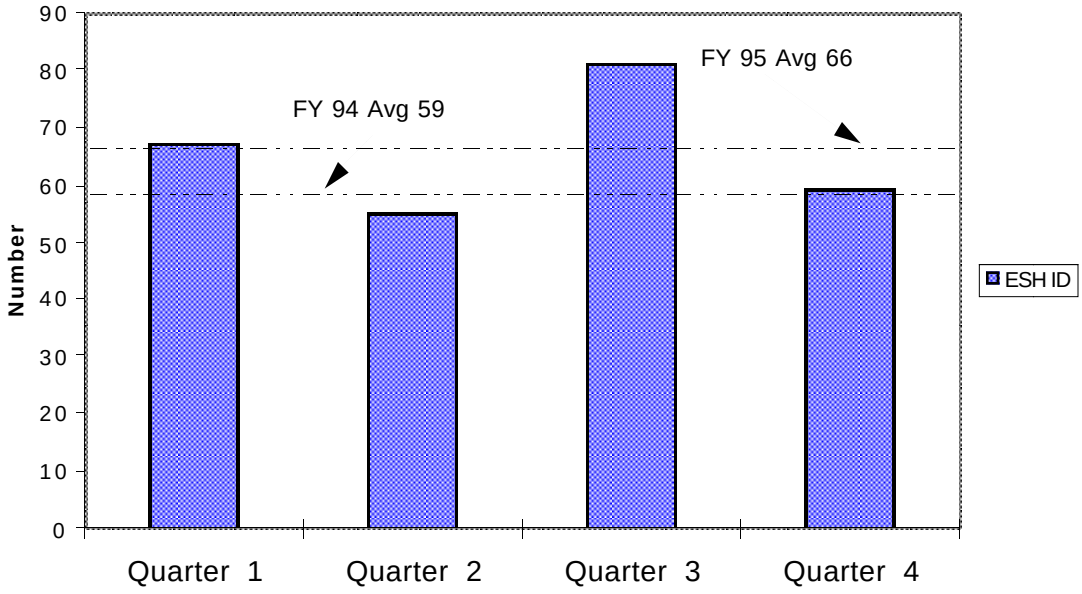


Figure 6.2.9 Design Review service demand profile for Fiscal Year 1995.

Figures 6.2.10-6.2.12 demonstrate results of the company's human resource planning and development actions. Figure 6.2.10 demonstrates the strategic shift towards education and the use of professional seminars in Fiscal Year 1995.

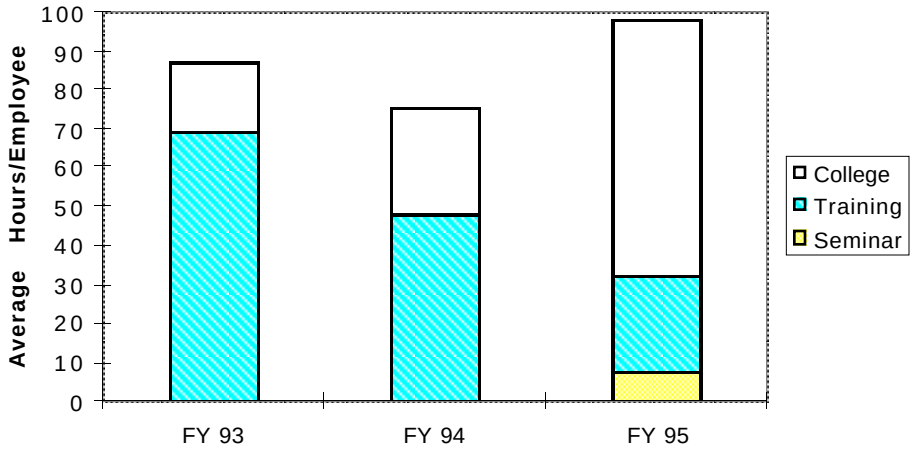


Figure 6.2.10 Employee education, training, and professional seminar hours trended over the last three fiscal years.

To measure and trend employee capability and versatility a weighted functional average of experience, training and education is used by the company. The function is expressed as:

$$\text{Employability} = \sum_i \omega_i A_i / \sum_i \omega_i$$

where the weights are set according to the rate they impact changes in versatility and capability, ranging from 1-4, and the attributes are college education, total experience, ES&H experience, training, seminars and conferences work. Figure 6.2.11 expresses the recent trends in the company's cumulative employability function. Figure 6.2.12 shows the annual rate of increase, a much more sensitive function.

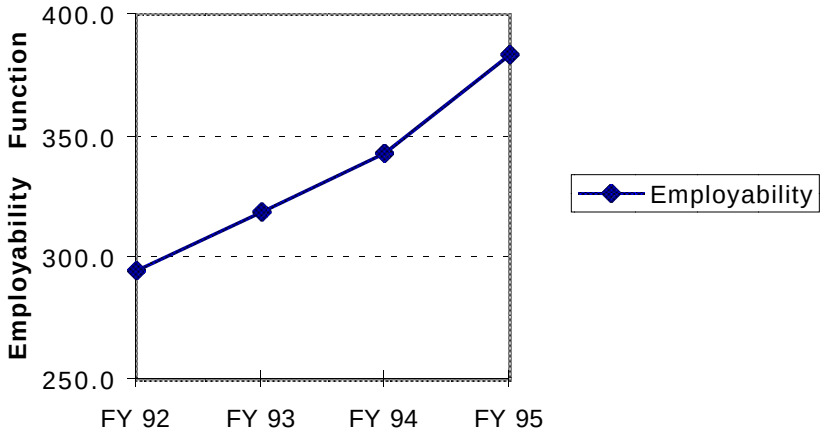


Figure 6.2.11 Trends in company personnel employability.

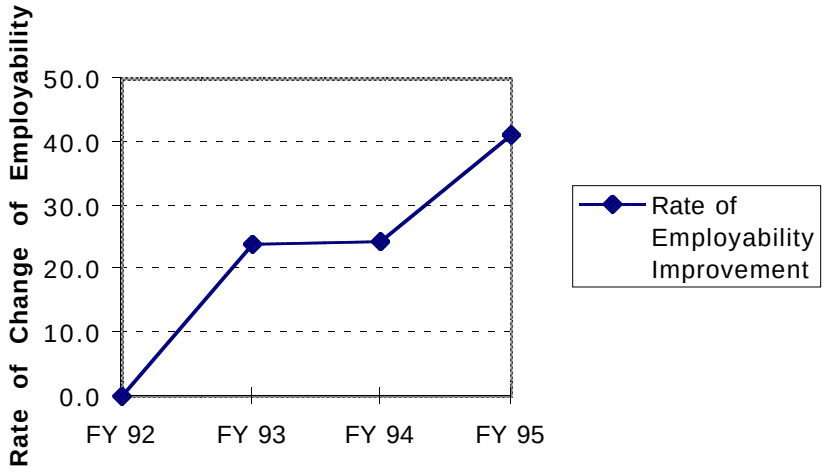


Figure 6.2.12 Rate of change of personnel employability as trended over the last three fiscal years.

Results from the company employee ratings of the Senior Executive performance, through the Upward Appraisal Process, showed significant SE performance improvements in 19 of 20 areas rated for 1994 and 1995. The results found that the SE rated at or above corporate peers in all 20 areas, and rated at or above peers in ES&H operations in 19 of 20 areas. Results are presented to company employees each year.

6.3 Supplier Performance

Supplier performance results have been measured in three areas. SME supplier costs for the ESH ID service have been reduced to $950 from $7500 for the preceding ES&H Questionnaire process as a result of supplier partnerships and process reengineering. Information systems and software developer performance is shown in Figure 6.2.1 and Table V. Supplier relationship building results are shown in Figure 7.4.2.

7.0 Customer Satisfaction and Marketing

7.1 Customer and Market Knowledge

Three major systems are used to determine long-term customer expectations and requirements. Due to the rapidly changing nature of the regulatory environment, 24 months is considered long-term. The first and foremost system is the use of the strategic planning exercises described in Section 3. A major focus of that exercise is the identification of strategic customer segments. The second system is a listening approach. This system uses periodic visits with competitors and presentation of publications at national conferences on hazard and risk management to provide additional information on trends in industry response and assist in anticipation of changing requirements and expectations. The third system relies on reviews of draft regulations prior to becoming law to provide lead time necessary to anticipate changing customer requirements.

Short-term systems are designed to determine changing requirements on a <6 month time frame. Systems include:

- Reviewing Facility Manager (strategic customer) meeting minutes.
- Participating in Corporate planning exercises.
- Reviewing Customer Science Proposals (Laboratory Director Research and Development, LDRD) to identify shifts in focus.
- Establishment of a weekly meeting, first thing Monday morning, designed for timely horizontal communication of information, concerns and rumors.

Where Facility Review service information is databased, customer portfolio analysis are performed to determine effectiveness in achieving strategic targeting. Figure 7.1.1 demonstrates the ESH ID portfolio analysis by project type. Projects are directly related with customer type.

Presentations and meetings with customers are prominent elements in gaining customer and market knowledge and in applying company capabilities in the relationship arena. Analyzed data and customer meetings are evaluated at the company and team levels and incorporated into process improvement activities described in Section 5.

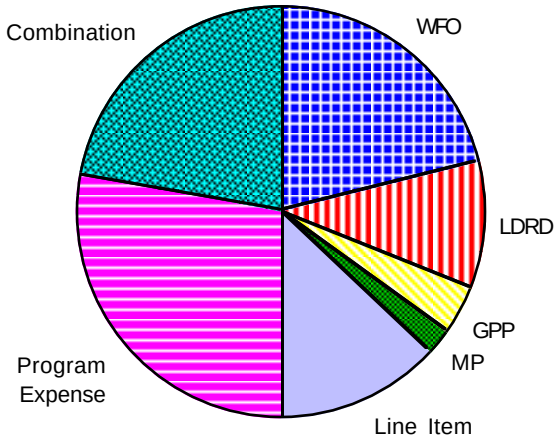


Figure 7.1 ESH ID project portfolio for Fiscal Year 1995. Analysis translates this information into a measure of effectiveness in targeting strategic customers. Other Facility Review services have less diverse customer bases. Analysis is performed mid-year for this data.

7.2 Customer Relationship

Four systems are in place for managing customer relationships:

- One-Way Systems
  - Facility Review to customer communications are provided by intermittent use of the corporate news bulletin.
  - Customer to Facility Review communications are provided by a customer feedback card being beta tested in the ESH ID service.
  - ESH ID process improvement customer survey measurement.
- Two-Way System
  - Face-to-Face meetings and discussions. In Fiscal Year 1995, 157 customers were involved in this way.

When external computer network connections to company offices are complete, the company plans to use a combination of electronic mailing lists and World-Wide-Web communications to improve customer and supplier contact. Plans for a paper communication bulletin were placed on hold based on projected operationing costs and the forecasted availability of the electronic technology.

Customer feedback and complaints are discussed with the entire company at weekly meetings. A spreadsheet tracking mechanism for customer comments, complaints and resolution is in beta test. A mechanism to repair relationships with extremely

dissatisfied customers exists and is infrequently used. It is internally known as "Customer for a Day." This methodology places a company employee at the customer's command to work through the company process with which the customer is dissatisfied. The perspective gained has resulted in improving company processes and stabilizing the relationship with the customer.

7.3 Customer Satisfaction Determination

Six processes are used to determine customer satisfaction:

- Customer Surveys - used infrequently to avoid annoying customers
- Service Evaluation Cards - in beta test. Part of service process is providing this mechanism for immediate feedback.
- Metrics Aligned With Customer Satisfaction - based upon customer requirements. This approach is more cost effective if requirements are carefully determined and understood. Examples would be cost of product, timely delivery of service, accuracy of information, etc..
- Customer complaint and compliment evaluation - described in Section 7.2.
- Face-to-face meetings
- Comparison data from related but not identical operations.

Major competitors are not yet publishing data on comparable products and services, thus that comparison is not feasible.

7.4 Customer Focus and Satisfaction

Customer satisfaction results have been measured for the ESH ID process. Figure 7.4.1 shows the number of new customers remained constant between Fiscal Years 1994 and 1995, with the number of repeat customers increasing.

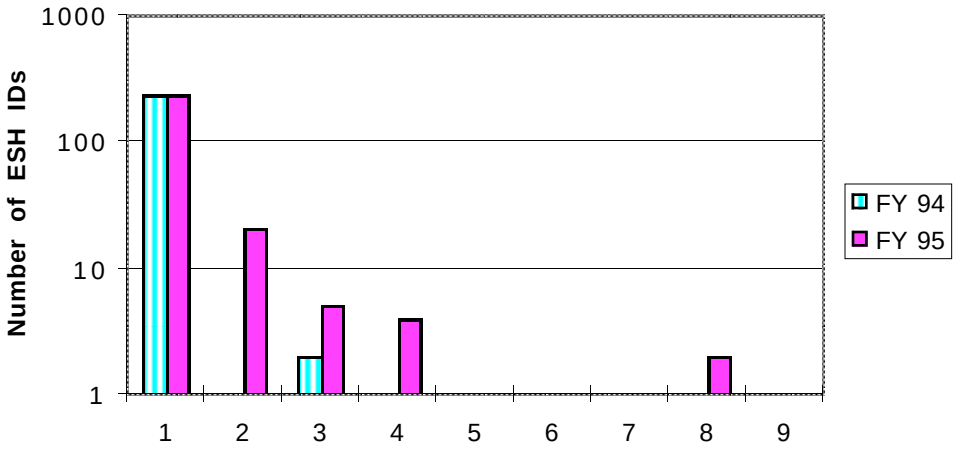


Figure 7.4.1 Growth in number of repeat customers for the ESH ID service between Fiscal Years 1994 and 1995. X-axis in number of times a customer used the ESH ID service.

To quantify customer focus for the ESH ID process, the number of face-to-face communications with customers is tracked. Figure 7.4.2 shows those results.

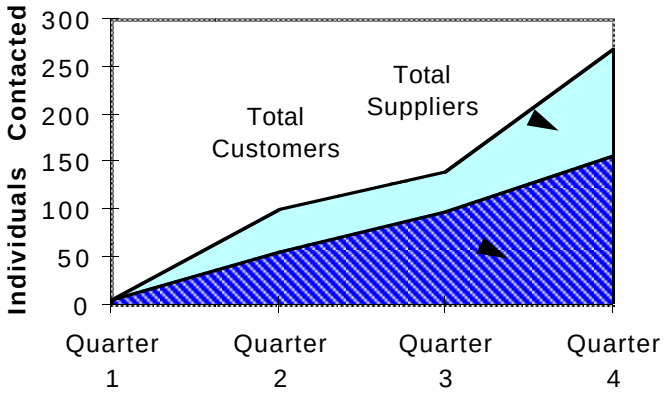


Figure 7.4.2 Relationship building trends for customers and suppliers for Fiscal Year 1995.

During Fiscal Year 1995, customers co-nominated the Facility Review Section for a corporate Distinguished Performance Award. During the same period, two company employees received three or more unsolicited expressions of customer satisfaction.

7.5 Customer Satisfaction Comparison

A detailed comparison customer survey was used to validate improvements in the ESH ID process over the preceding process. Significant improvements in customer satisfaction resulted and are documented in Figures 7.5.1 and 7.5.2. Tables VII and VIII document the instrument and have allowed the company to analyze its process and better understand customer requirements.

Customer satisfaction is measured, normalized, and presented on a four point scale for this application, where:

1 = Very Unsatisfied
2 = Unsatisfied
3 = Satisfied
4 = Very Satisfied

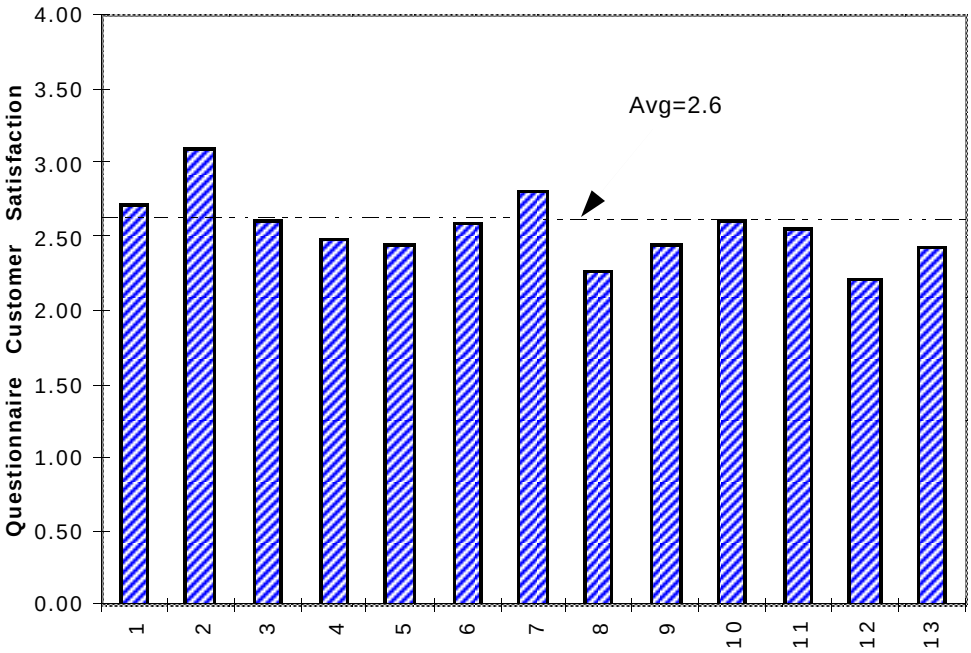


Figure 7.5.1 Old ES&H Questionnaire customer satisfaction survey results. Table VII lists the areas surveyed by the instrument.

Table VII. Areas of customer satisfaction surveyed for the ES&H Questionnaire for purposes of comparison to the ESH ID.

Number	Rating	Characteristic Tested
1	2.71	Assistance provided by ESH reviewers
2	3.10	Assistance provided by ESH-3, Facilities Review Section
3	2.60	Completing the data collection (ESH Questionnaire Form)
4	2.48	Documentation of identification for your project file
5	2.45	Documentation of resolution for your project file
6	2.58	ESH Checklist
7	2.79	ESH Questionnaire Meeting
8	2.26	ESH Subject Matter Expert availability
9	2.45	ESH Subject Matter Expert response to customers
10	2.62	Identification of ESH issues
11	2.55	Resolution of ESH issues
12	2.21	Timeliness of LANL resolution
13	2.43	Timeliness of LANL review

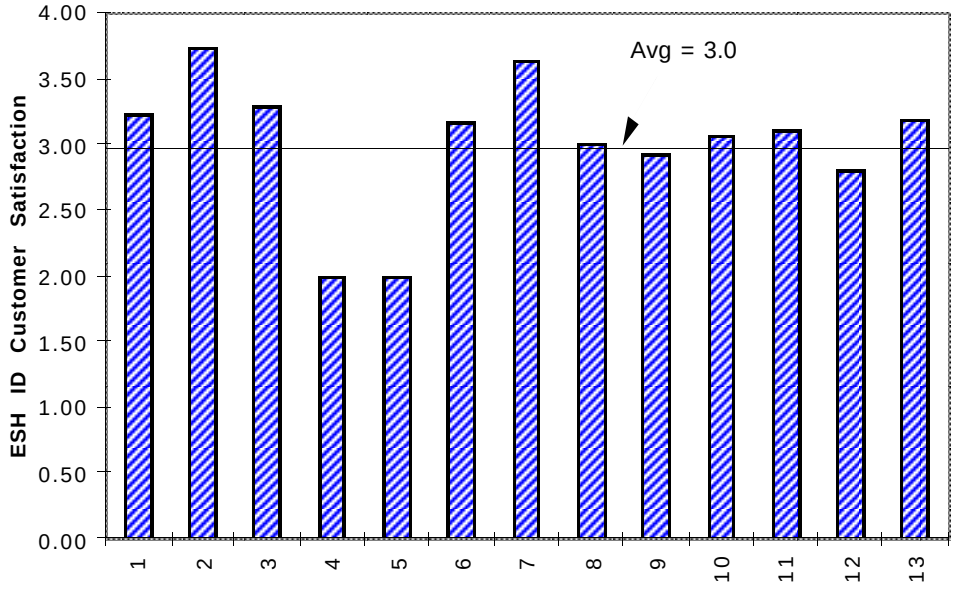


Figure 7.5.2 ESH ID customer satisfaction survey results. Table VIII lists the areas surveyed by the instrument.

Table VII. Areas of customer satisfaction surveyed for the ESH ID for purposes of comparison to the ES&H Questionnaire.

Number	Rating	Characteristic Tested
1	3.23	Assistance provided by ESH reviewers
2	3.73	Assistance provided by ESH-3, Facilities Review Section
3	3.29	Completing the data collection for ESH ID process
4	2.00	Documentation of identification for your project file
5	2.00	Documentation of resolution for your project file
6	3.17	ESH ID (project summary) closure memo
7	3.64	ESH on-site visit
8	3.00	ESH Subject Matter Expert availability
9	2.92	ESH Subject Matter Expert response to customers
10	3.08	Identification of ESH issues
11	3.11	Resolution of ESH issues
12	2.82	Timeliness of LANL resolution
13	3.19	Timeliness of LANL review

No data is available for comparison from those companies identified as "competitors." Some less applicable comparisons are provided in Table IX. Most of the listed programs supply SME service to the ESH ID, so it is interesting to note the value added by the ESH ID process.

It is also important to indicate that the data was collected using different instruments and analyzed by different approaches limiting the accuracy of the comparison. Caution should be used in reaching conclusions.

Table IX. Comparison of ESH ID Service Customer Satisfaction with available customer satisfaction data for other corporate support processes. Their are significant difference in customer segments, requirements and special needs between these programs and processes.

Program or Process	Comparative Rating
Nuclear Criticality Safety Program	3.8
ESH ID Service	***3.0***
Radiation Protection Program	2.9
Industrial Hygiene Program	2.9
Radiation Measurements	2.8
Safety Program	2.7
Facility Delivery Processes	2.2